# Clearing and Snagging (Ft.) 326

**DEFINITION**

Removing snags, drifts, or other obstructions from a channel or drainage way.

**PURPOSE**

Reducing significant human and/or natural environmental risks by improving physical characteristics of a channel to:

- Restore flow capacity;
- Prevent bank erosion by eddies;
- Reduce the formation of bars, where appropriate; and/or
- Minimize blockages by debris and ice.

**CONDITIONS WHERE PRACTICE APPLIES**

Any channel or urban floodway where the removal of trees, brush, and other obstructions is needed to accomplish one or more of the listed purposes.

**CRITERIA**

**General Criteria Applicable to All Purposes**

Clearing and Snagging shall be planned, designed, and installed to meet all federal, state, local and tribal laws and regulations.

Clearing and snagging shall not be completed on any channel where significant channel erosion will occur, major impairment to the landscape resource quality is likely, or significant impairment to habitat for fish and wildlife will occur, unless needed restoration actions are included with the application of this practice.

**Capacity.** The capacity of the channel, both before and after improvement, shall be determined using Manning's equation with applicable values of the retardance factor "n" from Supplement B to the National Engineering Handbook, Part 634, Hydraulic Engineering (formerly NEH Section 5), or similar source. The value of "n" used to determine channel capacity after improvement shall reflect the degree of natural changes and maintenance expected to occur in future years.

**Location.** The area to be cleared and snagged shall include the perimeter of the channel, the flow area of the urban floodway, or both. Trees on the bank that are leaning over or other objects that may fall into the channel shall also be included. If root balls are still attached to the streambank, cut off the log 6 to 12 inches (150 to 300 mm) above the ground and leave the stump and root mass for bank stability.

**Stability.** Clearing and snagging shall only be specified for other areas such as: berms, areas used for temporary disposal sites or travelways, or for other planned conservation uses where needed to implement this practice.

Clearing and snagging shall not impair channel stability. The criteria for determining channel stability shall comply with conservation practice standard Open Channel (582). The effect on downstream and upstream reaches due to the removal of obstructions shall be analyzed using appropriate stream and channel geomorphologic procedures.

If clearing and snagging will result in streambank erosion, criteria within conservation practice standard Streambank and Shoreline Protection (580) will be used in conjunction with this standard.

**Vegetation.** All areas denuded and disturbed during snag removal shall be revegetated, where practical, according to the NRCS conservation practice standard Critical Area Planting (342).

Disturbance of wetlands, riparian areas, and fish and wildlife habitat sites shall be minimized or avoided where possible. Cleared material shall be removed from the floodplain or deposited in approved areas that will not significantly affect the flow capacity of the stream.

Use vegetation adapted to the site that will accomplish the desired purpose. Preference shall be given to native species in order to reduce the introduction of invasive plant species; provide management of existing invasive species; and minimize the economic, ecological, and human health impacts that invasive species may cause. If native plant materials are not adaptable or proven effective for the planned use, then non-native species may be used. Refer to the Field Office Technical Guide, Section II, Invasive Plant Species, for plant materials identified as invasive species.

**CONSIDERATIONS**

Consider the potential effects of installation and operation of Clearing and Snagging on the cultural, archeological, historic and economic resources.

Ensure that threatened and endangered species and their habitat shall not be permanently adversely impacted by the use of this practice.

Effects on water quantity and quality should be considered.

Removal of deadfalls, stumps, and trees from streambanks and channels may increase discharge, velocity and channel capacity that could reduce flood damage from out of bank flow.

Improved flow conditions may lower the hydraulic gradient and drain flood plains more quickly. Rapid drawdown may cause sloughing of saturated, unstable streambanks.

Decreased groundwater recharge in water-losing streams may result from reduced residence time of water in the channel.

Temporary losses of aquatic or wetland habitat may occur with the removal of vegetation.

During implementation of the practice, there may be increased turbidity due to an increased sediment load. Water quality may be further degraded by chemical substances (i.e. organic nitrogen or phosphorus) attached to the sediment particles.

During construction, a heavy organic load may be produced resulting in a decreased availability of dissolved oxygen. Long-term effects may cause a decrease in yields of sediment and sediment-attached substances.

Increased surface water temperatures, at low flow, may occur from removal of shade-producing canopy until regrowth occurs. Accelerated flows may reduce the period of time water is exposed for “sun warming,” thus reducing water temperature.

In streams carrying dissolved substances, a reduction in ground water recharge may contribute to improved aquifer quality.

The number of pools and riffles forming the channel bottom may be reduced and fish habitat could be adversely affected.

Measures and construction methods that enhance fish and wildlife values should be incorporated as needed and practical. Special attention should be given to landscape aesthetics, to protecting and maintaining key shade, food, and den trees, and to stabilization of disturbed areas.

Consider construction methods that minimize equipment operation in the water in order to minimize turbidity during construction.

Consider contacting Federal, state, local, or tribal fisheries and environmental agencies for recommendations on measures and construction methods.

Consider removal methods and the disposal location of cleared material that will not be used for bioengineering (removal from site, placement in or out of the floodplain, not placed in wetland areas, etc.), and implement according to permit conditions, where applicable.

**PLANS AND SPECIFICATIONS**

Plans and specifications shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its intended use.

Support data documentation requirements are as follows:

- Inventory and evaluation records
  - Assistance notes or special report
- Survey notes, where applicable
  - Design survey
  - Construction layout survey
  - Construction check survey
- Design records
  - Physical data, functional requirements and site constraints, where applicable
  - Soils/subsurface investigation report, where applicable
- Design and quantity calculations
- Construction drawings/specifications with:
  - Location map
  - "Designed by" and "Checked by" names or initials
  - Approval signature
  - Job class designation
  - Initials from preconstruction conference
  - As-built notes
- Construction inspection records
  - Assistance notes or separate inspection records
  - Construction approval signature
- Record of any variances approved, where applicable
- Record of approvals of in-field changes affecting function and/or job class, where applicable.

**OPERATION AND MAINTENANCE**

An Operation and Maintenance (O&M) plan shall be developed for this practice. The O&M plan shall be consistent with the purposes of the practice, its intended life, safety requirements, and the criteria for the design.